

JONES LAKE STATE PARK AQUATIC INVENTORY

by

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edited by

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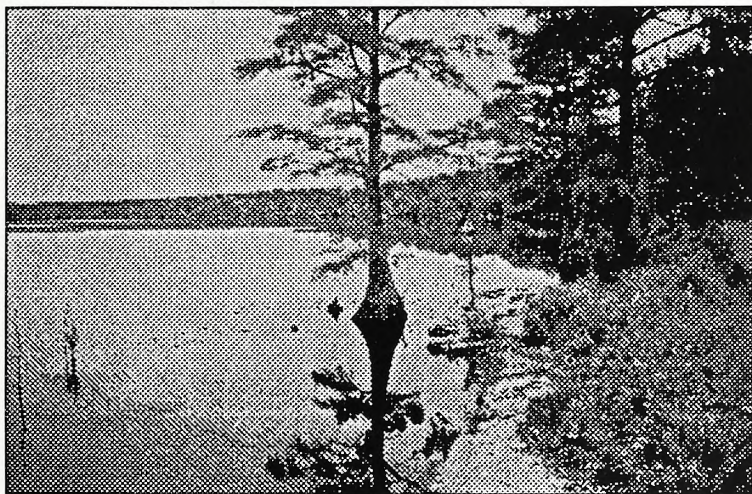
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**JONES LAKE STATE PARK
AQUATIC INVENTORY**



Jones Lake



Turnbull Creek

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JONES LAKE STATE PARK
AQUATIC INVENTORY



Figure 1



Figure 2

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Jones Lake State Park Aquatic Inventory

Introduction

Jones Lake State Park is located in Bladen County and encompasses 2,208 acres. Before the area was a park, the lands were used for agricultural purposes. The federal government was able to purchase the land between 1936 and 1939, because the population had increased beyond the land's ability to support it. Therefore, the land was considered submarginal. On July 1, 1939, the property was given to the state of North Carolina under a lease agreement. In 1954, the land was given to the state by the federal government. The park was opened in the summer of 1939 as the first state park for blacks. Years later it became fully integrated.

Within the park are two bay lakes, Jones and Salters. Bay lakes are concentrated in the Southeastern United States and are elliptical or oval depressions. They are referred to as bays because of the sweet, loblolly, and red bay that are found growing around them. There are approximately 500,000 bay lakes in the United States. Most of these lakes are filled with wet organic soils and are overgrown with vegetation. There are a few relic lakes that remain. The water levels fluctuate within Jones and Salters lakes, because they are not fed by streams or springs, but depend upon precipitation. The water in these lakes is highly acidic and contains few plant nutrients. Due to the acidity and the peat bottom of Jones and Salters lakes, the water is often dark in color.

The purpose of this project was to survey for aquatic species, including snails, mussels, sphaeriid clams, crayfish, and fish. Our inventory included Jones and Salters lakes and the Turnbull Creek and Ellis Creek subbasins. Figure 1 details the localities of all stations surveyed. The following sections provide information on the species in the above taxa documented at each site in the survey area.

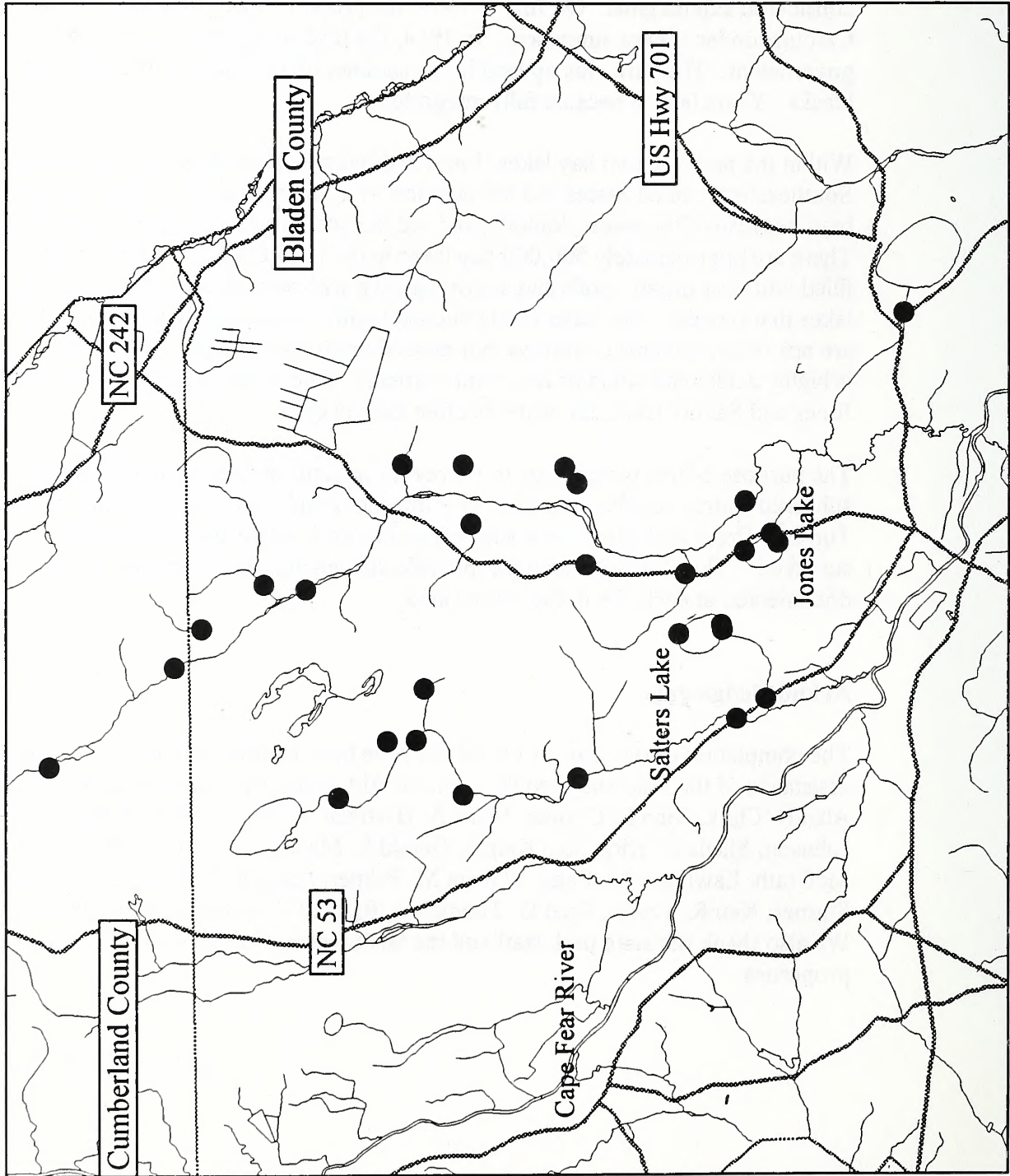
Acknowledgments

The completion of this project would not have been possible without the invaluable assistance of the following people: John M. Alderman, Alvin Braswell, Mike B. Carraway, Alan R. Clark, John E. Cooper, Mark A. Hartman, J. Chris Helms, Tom Henson, Judith A. Johnson, Sheila D. Kirk, Ken Knight, Gerald L. Mackie, Andrew H. McDaniel, Jr., Chris McGrath, Lawrence M. Page, William M. Palmer, Louis P. Polletta, Danny Smith, Wayne Starnes, Ken R. Taylor, Fred G. Thompson, Randall C. Wilson, and Melissa R. Wood. We also thank the state park staff and the landowners who allowed us to work on their properties.

Gabriela B. Mottes

JONES LAKE STATE PARK STATIONS INVENTORIED

Figure 1.



Aquatic Snails

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NC Wildlife Resources Commission

Introduction

There are approximately 500 species of aquatic snails currently recognized in North America. These 500 species are divided into 78 genera and 15 families (Burch 1989). In North Carolina, there are approximately 52 species representing 8 families (Adams 1990).

Snails are grouped into one of two subclasses. Prosobranch snails are gill-breathing and have an operculum, which is a calcareous plate that closes the aperture when the snail withdraws into its shell. Pulmonate snails are lung-breathing and do not have an operculum to seal their aperture (Burch 1989).

These animals graze on algae and other microscopic organisms using radular teeth to grind food to an appropriate size for consumption. Snails are an essential part of aquatic ecosystems, as well as indicators of water quality. However, they are typically overlooked. The lack of information and knowledge of snails can be attributed, in part, to their minute size, perceived lack of activity, cryptic habits, and difficulty in identification.

Methods

Study areas for this project included the aquatic habitats associated with Jones and Salters lakes and the Turnbull Creek and Ellis Creek subbasins (Fig. 1, Introduction Section). The lakes have extremely similar aquatic habitats. The substrate ranges from sand to a peat bottom, as one moves southwest to northeast across the lake. There is minimal woody debris and leaf litter. The pH in these bay lakes ranged from 3.7 - 4.0. The Turnbull Creek and Ellis Creek subbasins can be described as containing sluggish to moderately flowing streams with considerable leaf litter and woody debris. The predominant habitat within these streams was pool with some areas providing riffle and run habitat. The pH within these subbasins ranged from 3.8 - 5.7.

Specimens were collected using visual and tactile searches. Due to the cryptic habits of some snail species, it was necessary to sift and dredge the substrate. All available habitats were sampled. Snails were preserved and stored in 70% ethanol.

Snails and limpet snails were identified by using Burch (1989) and Basch (1963). Expected distributions and the following characteristics were used to identify the specimens: presence/absence of an operculum, direction of coiling, shell size, shape, color and thickness, texture of the shell, placement of apex, shape and number of the whorls,

and the shape of the apertural lip. With the acquisition of additional information, identifications may be subject to change.

Results and Discussion

Snails were located at thirteen of the sites surveyed (Fig. 1). One species was found within the Turnbull Creek and Ellis Creek subbasins (Table 1). There were no snails found in Jones or Salters lakes. The high acidity of the water, along with the lack of a calcium source necessary for the building of the calcareous snail shell, are possible reasons for the absence of these organisms.

Ferrissia fragilis (Tryon, 1863) was common throughout both subbasins. Specimens were collected on leaves, stems, wood, rocks, and glass. This, the fragile ancyloid, is said to have a wide distribution and to prefer sluggish habitats (Basch 1963). Populations of this ancyloid had been previously found in the Turnbull Creek and Ellis Creek subbasins (Porter, pers. comm. 1996).

Resources

Adams, W. F. (ed). 1990. A Report on the Conservation Status of North Carolina's Freshwater and Terrestrial Molluscan Fauna. The Scientific Council on Freshwater and Terrestrial Mollusks. 246 pp.

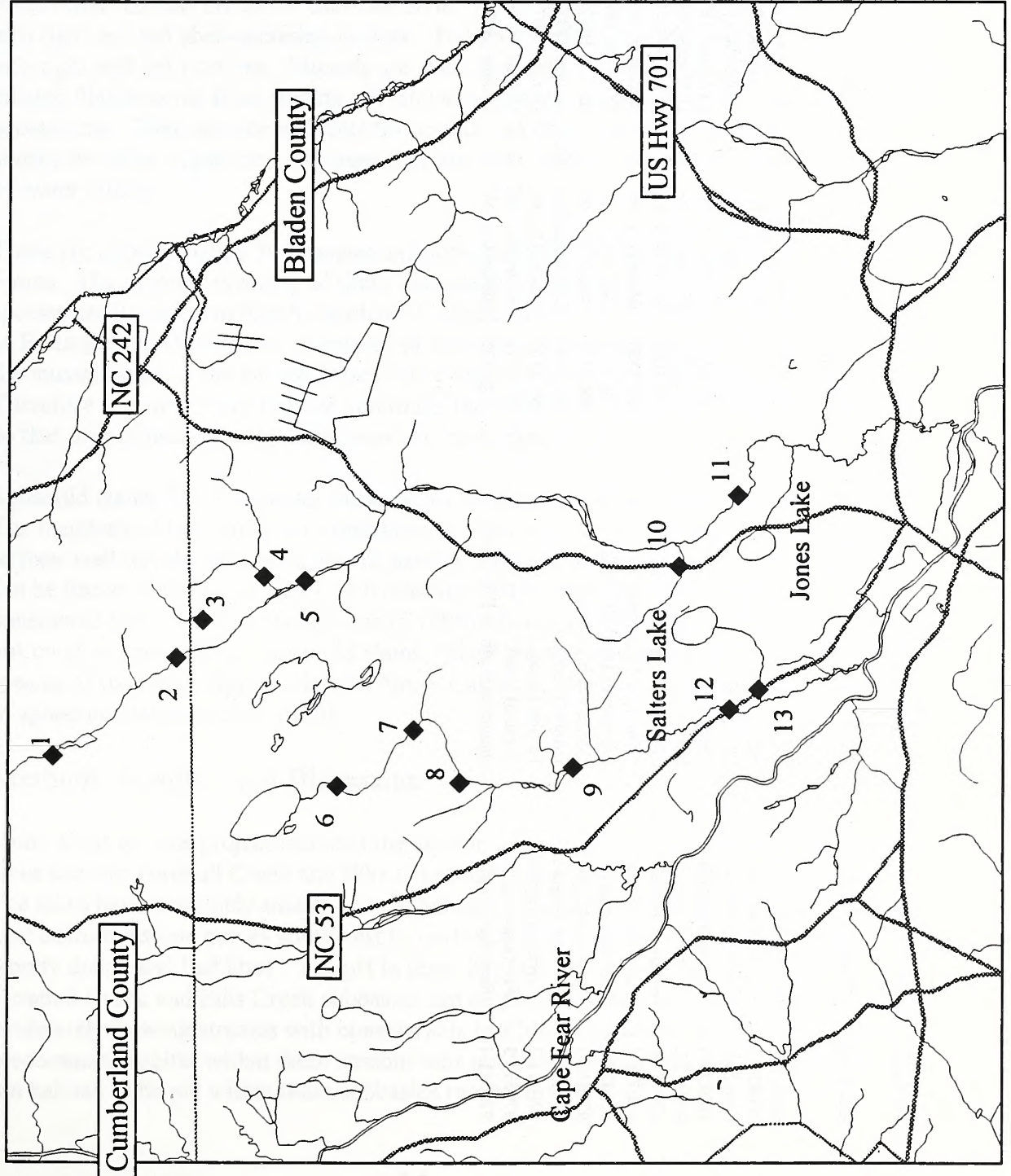
Basch, P. F. 1963. A Review of the Recent Freshwater Limpet Snails of North America (Mollusca: Pulmonata). Bulletin: Museum of Comparative Zoology, Harvard University. 129(8): 399-461.

Burch, J. B. 1989. *North American Freshwater Snails*. Malacological Publications. Hamburg, MI. 365 pp.

Porter, H. J. 1996. Personal communication.

JONES LAKE STATE PARK AQUATIC SNAIL SPECIES INVENTORY

Figure 1.



Legend

Dot No.	Station No.
1	960828.4
2	970611.1
3	970324.4
4	970313.8
5	970611.2
6	970324.3
7	970610.5
8	970611.4
9	960829.3
10	970313.2
11	970611.3
12	960829.2
13	960829.1

Table 1. Snails found in the Ellis Creek and Turnbull Creek subbasins

<u>Station No.</u>	<u>Scientific Name</u>	<u>Waterway</u>	<u>Common Locality</u>	<u>County</u>	<u>Date</u>	<u>Number</u>	<u>Identified By</u>
960828.4	<i>Ferrissia fragilis</i>	Turnbull Creek	SR 1002	Cumberland Co., NC	28 August 1996	26	G.B. Mottesi
960829.1	<i>Ferrissia fragilis</i>	tributary to Ellis Creek	NC 53	Bladen Co., NC	29 August 1996	29	G.B. Mottesi
960829.2	<i>Ferrissia fragilis</i>	Ellis Creek	NC 53	Bladen Co., NC	29 August 1996	6	G.B. Mottesi
960829.3	<i>Ferrissia fragilis</i>	Ellis Creek	SR 1324	Bladen Co., NC	29 August 1996	21	G.B. Mottesi
970313.2	<i>Ferrissia fragilis</i>	tributary to Turnbull Creek	NC 242	Bladen Co., NC	13 March 1997	9	G.B. Mottesi
970313.8	<i>Ferrissia fragilis</i>	tributary to Turnbull Creek	SR 1002	Bladen Co., NC	13 March 1997	1	G.B. Mottesi
970324.3	<i>Ferrissia fragilis</i>	tributary to Ellis Creek	SR 1327	Bladen Co., NC	24 March 1997	10	G.B. Mottesi
970324.4	<i>Ferrissia fragilis</i>	tributary to Turnbull Creek	SR 1002	Bladen Co., NC	24 March 1997	3	G.B. Mottesi
970610.5	<i>Ferrissia fragilis</i>	tributary to Ellis Creek	SR 1325	Bladen Co., NC	10 June 1997	13	G.B. Mottesi
970611.1	<i>Ferrissia fragilis</i>	Turnbull Creek	SR 2046	Cumberland Co., NC	11 June 1997	84	G.B. Mottesi
970611.2	<i>Ferrissia fragilis</i>	Turnbull Creek	SR 1331	Bladen Co., NC	11 June 1997	37	G.B. Mottesi
970611.3	<i>Ferrissia fragilis</i>	Turnbull Creek	SR 1511	Bladen Co., NC	11 June 1997	7	G.B. Mottesi
970611.4	<i>Ferrissia fragilis</i>	channelized trib. to Ellis Creek	SR 1325	Bladen Co., NC	11 June 1997	3	G.B. Mottesi

Freshwater Mussels and Sphaeriid Clams

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NC Wildlife Resources Commission

Introduction

Freshwater mussels are in the Class Bivalvia. As the name implies, the mussel is separated into right and left shell-secreting centers. The shell itself is a single entity which is divided into right and left portions. Mussels are characterized by having greatly enlarged gills with ciliated filaments for filter feeding. Freshwater mussels are integral parts of many aquatic ecosystems. They provide nutrients for insects and other invertebrates and are a food source for other organisms. Because they are filter feeders, they are excellent indicators of water quality.

There are approximately 300 species and subspecies of freshwater mussels in the United States. The greatest diversity of these mussels occurs in the Southeast. Roughly 70 species can be found in North Carolina. Unfortunately, approximately half are state listed as Endangered, Threatened, or species of Special Concern (Adams 1990). It appears that the mussel fauna of the United States is in danger of extinction (Williams, et al. 1992). Therefore, it is necessary that we determine the status and distribution of these organisms so that proper management techniques can be applied.

Sphaeriid clams, like freshwater mussels, are in the Class Bivalvia and are filter feeders. The members of this family are considered the pea, pill, nut or fingernail clams. Because of their well-developed mechanism of passive dispersal and adaptability, sphaeriid clams can be found in almost any body of freshwater. Therefore, their distributions are considered truly cosmopolitan (Branson 1988). In spite of their cosmopolitan distribution, not much is known about sphaeriid clams. They are represented in North America by 38 species of the family Sphaeriidae. In North Carolina, there are approximately 13 species of sphaeriid clams (Adams 1990).

Methods, Results, and Discussion

Study areas for this project included the aquatic habitats associated with Jones and Salters lakes and the Turnbull Creek and Ellis Creek subbasins (Fig. 1, Introduction Section). The lakes have extremely similar aquatic habitats. The substrate ranges from sand to a peat bottom, as one moves southwest to northeast across the lake. There is minimal woody debris and leaf litter. The pH in these bay lakes ranged from 3.7 - 4.0. The Turnbull Creek and Ellis Creek subbasins can be described as containing sluggish to moderately flowing streams with considerable leaf litter and woody debris. The predominant habitat within these streams was pool with some areas providing riffle and run habitat. The pH within these subbasins ranged from 3.8 - 5.7.

There were no mussels or sphaeriid clams found in Jones Lake, Salters Lake or the Turnbull Creek and Ellis Creek subbasins. The high acidity of the water, along with the lack of a calcium source necessary for the building of the calcareous mussel and sphaeriid clam shell, are possible reasons for the absence of these organisms.

Resources

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- Branson, B. A. 1988. The Sphaeriacean Clams (Mollusca: Bivalvia) of Kentucky. *Transactions of the Kentucky Academy of Science*. 49(1-2): 8-14.
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Crayfish

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NC Wildlife Resources Commission

Introduction

There are currently 338 recognized species of crayfish in the United States and Canada, the greatest diversity of which reside in the Southeast (Taylor et al. 1996). In North Carolina, there are 30 native and 2 introduced species of crayfish (Cooper, pers. comm., 1997). Of these 32 species, nine are listed as significantly rare by the North Carolina Natural Heritage Program (LeGrand and Hall 1995).

Crayfish play a significant role in aquatic ecosystems by representing a large percentage of the biomass in lentic and lotic waters. As prey, they are an important food resource for centrarchids (Rabeni 1992) in addition to birds and mammals (Crocker and Barr 1968). As consumers, they forage for a wide range of nourishment including detritus, aquatic vegetation, arthropods, mollusks, crustaceans, fish, and amphibians (Hobbs III 1993).

Crayfish forage mostly at night and usually seek shelter from predators during daylight hours under cobble and woody debris, in root mats, burrows, or depressions. They are gill breathing organisms and require an aquatic habitat to absorb oxygen from the water. In accordance with habitat preferences, crayfish are classified as either non-burrowers or burrowers. Non-burrowers spend their entire life in the stream bed while burrowers excavate tunnels in roadside ditches, wet pastures, and flood plains (Taylor et al. 1996). Different species of burrowers spend different amounts of their life cycle in subterranean domains.

The average life span of a crayfish is between two and three years (Taylor et al. 1996). During this time, they grow through a series of molts of their exoskeleton. They have five pairs of abdominal appendages called pleopods. The first pleopod pair of the male is modified as a sexual organ. In the family Cambaridae (which includes all North Carolina species), there are two designations for adult male crayfish: Form I and Form II. Throughout their lives, adult males cycle between these forms. Morphologically both forms are similar except in the texture and shape of the first pleopod. Form I males are able to sexually reproduce while Form II males are not. Unlike adult males, adult females do not cycle between morphological forms and once they reach adulthood, they can sexually reproduce.

Although crayfish are common in many freshwater ecosystems, there are significant gaps in our understanding of the distribution, biology and taxonomy of many species. A recent report on the "Conservation Status of Crayfishes of the United States and Canada"

estimated that in the United States and Canada 50% of crayfish species are "in need of conservation recognition" (Taylor et. al. 1996). In North Carolina, researchers are currently investigating the taxonomy and distribution of approximately ten species which are undescribed or belong to species complexes (Cooper, pers. comm., 1997).

This survey focused on North Carolina state park waterways and their surrounding tributaries. Since the emphasis of the project was on the surface water inhabitants, most of the crayfish collected were non-burrowers. Due to time and weather restrictions, the exact distribution of each species within the state park and its associated waterways was not determined. An estimation was made for the relative abundance of each species collected. In addition, specific habitat preferences for each species were noted.

Methods

Crayfish were surveyed in Jones Lake, Salters Lake and the Ellis Creek and Turnbull Creek subbasins (Fig. 1). Species were collected with a dipnet and a 6' X 10' mesh net seine. Specimens were preserved and stored in 70% ethanol.

A variety of resources were consulted for identification. "An Illustrated Checklist of the American Crayfishes" (Hobbs 1989) was particularly helpful as well as an unpublished key of North Carolina crayfish (Hobbs 1991). Dr. John Cooper, North Carolina State Museum of Natural Sciences, also provided information used for identification. With additional information, the present identifications may be subject to change.

The key feature used to differentiate crayfish species from one another is the morphology and structure of the first pleopod pair of the Form I male. Form II males, juvenile males, and females can be recognized by their carapace, chelae, rostrum shape, and body coloration.

The carapace is the protective exoskeletal plate which encompasses the anterior half of the crayfish body. Its distinguishing features include the depth/width ratio and the placement of spinose ornamentation. The chelae are enlarged claws on the first pair of legs. Their important characteristics are the shape, which can be long and narrow or round and full, and setae, which are present only in some species. The rostrum refers to the anterior most portion of the carapace and it can be spinose or smooth. In terms of coloration, the exoskeleton can be plain, marbled, or striped with shades of blue, brown, tan, olive, and red.

Specimens were recorded as Form I male (MI), Form II male (MII), juvenile male (jM), adult female (F), and juvenile female (jF). Adult versus juvenile specimens were distinguished based on size. Carapace length was measured from the tip of the rostrum to the posterior carapace edge (Page 1985).

Results

Collections were made from 29 sites on 8 days between 28 August 1996 and 24 June 1997. Crayfish were collected or observed at 18 sites (Table 1). No crayfish were found in either Jones Lake or Salters Lake. Two species were collected during the survey: *Cambarus (Depressicambarus) latimanus* (LeConte, 1856) and *Procambarus (Ortmannicus) acutus acutus* (Girard, 1852).

Procambarus (O.) a. acutus was found most commonly in run and pool habitats with sandy substrate, woody debris, and aquatic vegetation. A total of 112 specimens were observed or collected (3 MI, 21 MII, 33 jM, 27 F, 28 jF). Carapace length ranged from 5.30 to 46.05 mm; mean length was 22.39 (± 8.78) mm. Form I males were collected on 13 March and 10 June 1997.

Cambarus (D.) latimanus was found in pool habitat with sand substrate. The area also had a large percentage of woody debris and leaf litter. A total of 5 specimens were collected (1 MII, 1 jM, 2 F, 1 jF). Carapace length ranged from 14.25 to 35.40 mm; mean length was 25.01 (± 9.20).

Discussion

The Ellis Creek and Turnbull Creek subbasins appear to be dominated by one species of crayfish, *Procambarus (O.) a. acutus*, and there is a great abundance of this species in these areas. The habitat of this species is described as "sluggish to moderately flowing streams and most lentic situations" (Hobbs 1989) and members of this species in other parks surveyed were commonly associated with sand substrate and pool habitat. These habitat descriptions are typical of the aquatic habitat associated with Jones Lake State Park.

Cambarus (D.) latimanus was not common throughout the survey area but was found at two sites. *C. (D.) latimanus* is a burrowing species which spends part of its life cycle in subterranean habitats (Hobbs 1989) which may help explain the minimal numbers collected.

Resources

Cooper, J. E. 1997. Personal communication.

Cooper, J. E. and A. L. Braswell. 1995. Observations on North Carolina crayfishes. (Decapoda: Cambaridae). *Brimleyana*. 22: 87-132.

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- Page, L. M. 1985. The crayfishes and shrimps (Decapoda) of Illinois. *Illinois Natural History Survey Bulletin*. 33(4): 335-347.
- Rabeni, C. F. 1992. Trophic linkage between stream centrarchids and their crayfish prey. *Can. J. Fish. Aquat Sci.* 49: 1714-1721.
- Taylor, C. A., M. L. Warren, Jr., J. F. Fitzpatrick, Jr., H. H. Hobbs III, R. F. Jezerinac, W. L. Pflieger, and H. W. Robison. 1996. Conservation status of crayfishes of the United States and Canada. *Fisheries*. 21(4): 25-37.

JONES LAKE STATE PARK CRAYFISH SPECIES INVENTORY

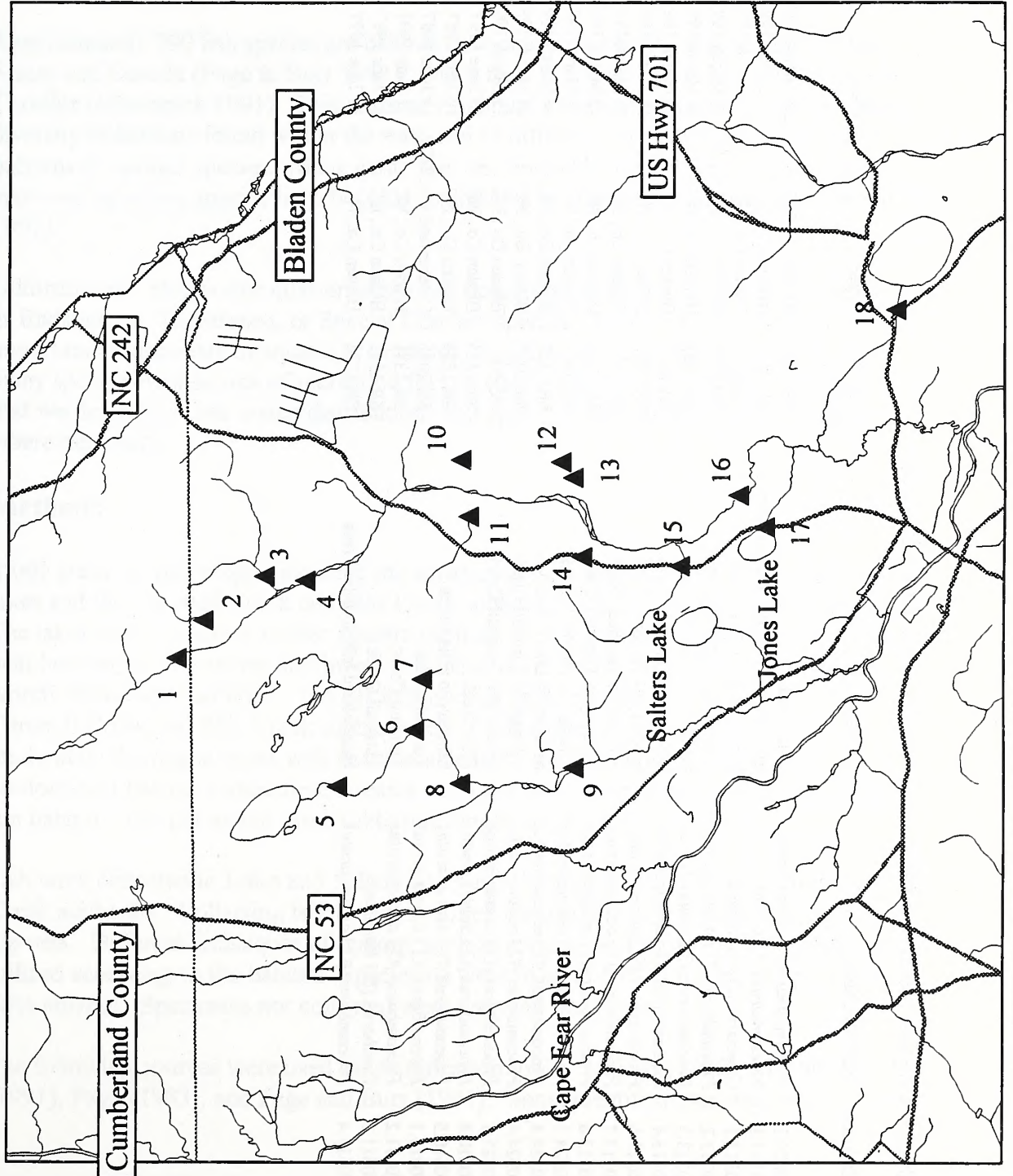


Figure 1.

Table 1. Crayfish found in the Ellis Creek and Turnbull Creek subbasins

Station No.	Scientific Name	Waterway	Common Locality	County	Date	Number/Sex	Identified By
960829.3	<i>Procambarus (O.) acutus acutus</i>	Ellis Creek	SR 1324	Bladen Co., NC	29 August 1996	3jM, 5jF	M.E. Savacool
970313.1	<i>Procambarus (O.) acutus acutus</i>	tributary to Turnbull Cr. from Jones L.	NC 242	Bladen Co., NC	13 March 1997	1jM, 5F, 5jF	M.E. Savacool
970313.2	<i>Cambarus (D.) latimanus</i>	tributary to Turnbull Creek	NC 242	Bladen Co., NC	13 March 1997	1MII, 1jM, 1F	M.E. Savacool
970313.3	<i>Procambarus (O.) acutus acutus</i>	tributary to Turnbull Creek	NC 242	Bladen Co., NC	13 March 1997	2MII, 7jM, 1F, 5jF	M.E. Savacool
970313.4	<i>Procambarus (O.) acutus acutus</i>	tributary to Turnbull Creek	SR 1509	Bladen Co., NC	13 March 1997	1MI, 3MII, 8F	M.E. Savacool
970313.5	<i>Procambarus (O.) acutus acutus</i>	tributary to Turnbull Creek	SR 1505	Bladen Co., NC	13 March 1997	1MII, 1jM	M.E. Savacool
970313.7	<i>Procambarus (O.) acutus acutus</i>	tributary to Turnbull Creek	SR 1507	Bladen Co., NC	13 March 1997	1MII, 7jM, 1F, 4jF	M.E. Savacool
970313.8	<i>Procambarus (O.) acutus acutus</i>	tributary to Turnbull Creek	SR 1505	Bladen Co., NC	13 March 1997	2MII, 4jM, 1jF	M.E. Savacool
970324.1	<i>Procambarus (O.) acutus acutus</i>	tributary to Turnbull Creek	SR 1002	Bladen Co., NC	13 March 1997	4F	M.E. Savacool
970324.3	<i>Procambarus (O.) acutus acutus</i>	tributary to Turnbull Creek	NC 242	Bladen Co., NC	24 March 1997	2jM, 3F, 1jF	M.E. Savacool
970324.4	<i>Procambarus (O.) acutus acutus</i>	tributary to Ellis Creek	SR 1327	Bladen Co., NC	24 March 1997	1F	M.E. Savacool
970325.1	<i>Procambarus (O.) acutus acutus</i>	tributary to Turnbull Creek	SR 1002	Bladen Co., NC	24 March 1997	3jM, 2F	M.E. Savacool
970610.4	<i>Procambarus (O.) acutus acutus</i>	tributary to Turnbull Creek	NC 53	Bladen Co., NC	25 March 1997	3MII, 3F	M.E. Savacool
970610.5	<i>Procambarus (O.) acutus acutus</i>	Ellis Creek	SR 1325	Bladen Co., NC	10 June 1997	2MI, 4MII	M.E. Savacool
970611.1	<i>Procambarus (O.) acutus acutus</i>	tributary to Ellis Creek	SR 1325	Bladen Co., NC	10 June 1997	2MII, 1F	M.E. Savacool
970611.2	<i>Procambarus (O.) acutus acutus</i>	Turnbull Creek	SR 2046	Cumberland Co., NC	11 June 1997	3MII, 2F	M.E. Savacool
970611.3	<i>Cambarus (D.) latimanus</i>	Turnbull Creek	SR 1331	Bladen Co., NC	11 June 1997	2MII, 2F	M.E. Savacool
970611.4	<i>Procambarus (O.) acutus acutus</i>	Turnbull Creek	SR 1511	Bladen Co., NC	11 June 1997	1F, 1jF	M.E. Savacool
		channelized trib. to Ellis Creek	SR 1325	Bladen Co., NC	11 June 1997	1F	M.E. Savacool

Freshwater Fishes

Gabriela B. Mottes, Nongame Biologist
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Division of Wildlife Management
NC Wildlife Resources Commission

Introduction

Approximately 790 fish species are believed to occur in the freshwaters of the United States and Canada (Page & Burr 1991). More than 225 species can be found in North Carolina (Menhinick 1991). This unusually rich and variable fish fauna is due to a great diversity of habitats found within the state and to different zoogeographic distribution patterns of various species. Many game species, several bait and forage species, and at least one aquarium species have become established in North Carolina waters (Menhinick 1991).

Unfortunately, almost one quarter of the fish occurring in North Carolina are state listed as Endangered, Threatened, or Special Concern species. This is of concern since fish are important components of aquatic ecosystems; they are indicators of water quality; and many species are a source of recreation for the state's citizens. Therefore, it is important that we determine their status/distributions and apply proper conservation techniques where necessary.

Methods

Study areas for this project included the aquatic habitats associated with Jones and Salters lakes and the Turnbull Creek and Ellis Creek subbasins (Fig. 1, Introduction Section). The lakes have extremely similar aquatic habitats. The substrate ranges from sand to a peat bottom, as one moves southwest to northeast across the lake. There is minimal woody debris and leaf litter. The pH in these bay lakes ranged from 3.7 - 4.0. The Turnbull Creek and Ellis Creek subbasins can be described as containing sluggish to moderately flowing streams with considerable leaf litter and woody debris. The predominant habitat within these streams was pool with some areas providing riffle and run habitat. The pH within these subbasins ranged from 3.8 - 5.7.

Fish were collected in Jones and Salters lakes and throughout the Turnbull Creek and Ellis Creek subbasins. Collecting techniques included the use of a 6' x 10' minnow seine and dip nets. Different techniques of seining, such as kicking, and setting and dragging, were utilized according to the habitat. Specimens were fixed in 10% formalin and preserved in 70% ethanol. Specimens not collected were returned unharmed.

The following sources were used as identification tools: Jenkins (1995), Menhinick (1991), Page (1983), and Page and Burr (1991). Some identifications were verified using

specimens from the collection of the NC State Museum of Natural Sciences. With the acquisition of additional information, identifications may be subject to change.

Results and Discussion

Figure 1 details the localities of the twenty-two stations where fish were found. Fifteen species of fish representing ten families were detected within the area surveyed (Table 1). Some of the habitat requirements/preferences of the species found are discussed below (compiled from Etnier & Starnes 1994 and Jenkins & Burkhead 1993).

Umbra pygmaea (Dekay, 1842) can be found within the vegetation and muddy substrate of slow-moving creeks and rivers. *Esox americanus* Gmelin, 1788 thrives in densely vegetated, low pH, sluggish waterways. *Notropis chalybeus* (Cope, 1869) can be located in the open water areas of creeks and rivers. *Erimyzon sucetta* (Lacepède, 1803) prefers the calm areas of vegetated creeks and rivers.

The two species that were found within the family Ictaluridae, are associated with sluggish creeks and rivers. *Ameiurus natalis* (Lesueur, 1819) can be found in virtually all aquatic habitats; whereas, *Noturus gyrinus* (Mitchill, 1817) is limited to habitats without current (Etnier & Starnes 1993).

Chologaster cornuta Agassiz, 1853 and *Aphredoderus sayanus* (Gilliams, 1824) are associated with areas of dense aquatic vegetation and very slow moving current. *Gambusia holbrooki* Girard, 1859 is a surface dweller of quiet, shallow backwaters.

Centrarchus macropterus (Lacepède, 1801), *Enneacanthus gloriosus* (Holbrook, 1855), and *Enneacanthus obesus* (Girard, 1854), all within the family Centrarchidae, have similar habitat requirements. They can all be found within the vegetation of the pool and backwater areas of acidic, sluggish waterways (Jenkins & Burkhead 1994).

Etheostoma fusiforme (Girard, 1854) and *Etheostoma serrifer* (Hubbs & Cannon, 1935) also have similar habitat requirements. They prefer slow-moving, dark water streams, with woody debris and dense aquatic vegetation. *Perca flavescens* (Mitchill, 1848) can be encountered in a wide range of habitats, but prefers the pools and backwater areas of the waterways it inhabits.

The waterways associated with Jones Lake State Park provide the sluggish, densely vegetated, low pH habitats that the species listed above require. Therefore, most of the species were found in relatively good numbers (Table 2) at each of the stations, considering that there were difficulties seining in many areas with significant leaf litter and woody debris.

Between 1957 and 1959 a survey of Jones and Salters lakes, among other bay lakes, was accomplished by the NC Wildlife Resources Commission (Louder 1962). Their survey included the use of rotenone, gill nets, and trammel nets. The following species were

found: *Esox americanus*, *Esox niger*, *Erimyzon sucetta*, *Ictalurus natalis*, *Noturus gyrinus*, *Aphredoderus sayanus*, *Fundulus notti*, *Gambusia holbrooki*, *Centrarchus macropterus*, *Enneacanthus gloriosus*, *Lepomis gulosus*, *Micropterus salmoides*, *Etheostoma fusiforme*, and *Perca flavescens*.

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Table 1. Fish found in the waterways of Jones Lake State Park

Umbridae	
<i>Umbra pygmaea</i> (DeKay, 1842)	Eastern mudminnow
Esocidae	
<i>Esox americanus</i> Gmelin, 1788	Redfin pickerel
Cyprinidae	
<i>Notropis chalybaeus</i> (Cope, 1869)	Ironcolor shiner
Catostomidae	
<i>Erimyzon sucetta</i> (Lacepède, 1803)	Lake chubsucker
Ictaluridae	
<i>Ameiurus natalis</i> (Lesueur, 1819)	Yellow bullhead
<i>Noturus gyrinus</i> (Mitchill, 1817)	Tadpole madtom
Amblyopsidae	
<i>Chologaster cornuta</i> Agassiz, 1853	Swampfish
Aphredoderidae	
<i>Aphredoderus sayanus</i> (Gilliams, 1824)	Pirate perch
Poeciliidae	
<i>Gambusia holbrooki</i> Girard, 1859	Eastern mosquitofish
Centrarchidae	
<i>Centrarchus macropterus</i> (Lacepède, 1801)	Flier
<i>Enneacanthus gloriosus</i> (Holbrook, 1855)	Bluespotted sunfish
<i>Enneacanthus obesus</i> (Girard, 1854)	Banded sunfish
Percidae	
<i>Etheostoma fusiforme</i> (Girard, 1854)	Swamp darter
<i>Etheostoma serrifer</i> (Hubbs & Cannon, 1935)	Sawcheek darter
<i>Perca flavescens</i> (Mitchill, 1814)	Yellow perch

JONES LAKE STATE PARK FISH SPECIES INVENTORY

Figure 1.

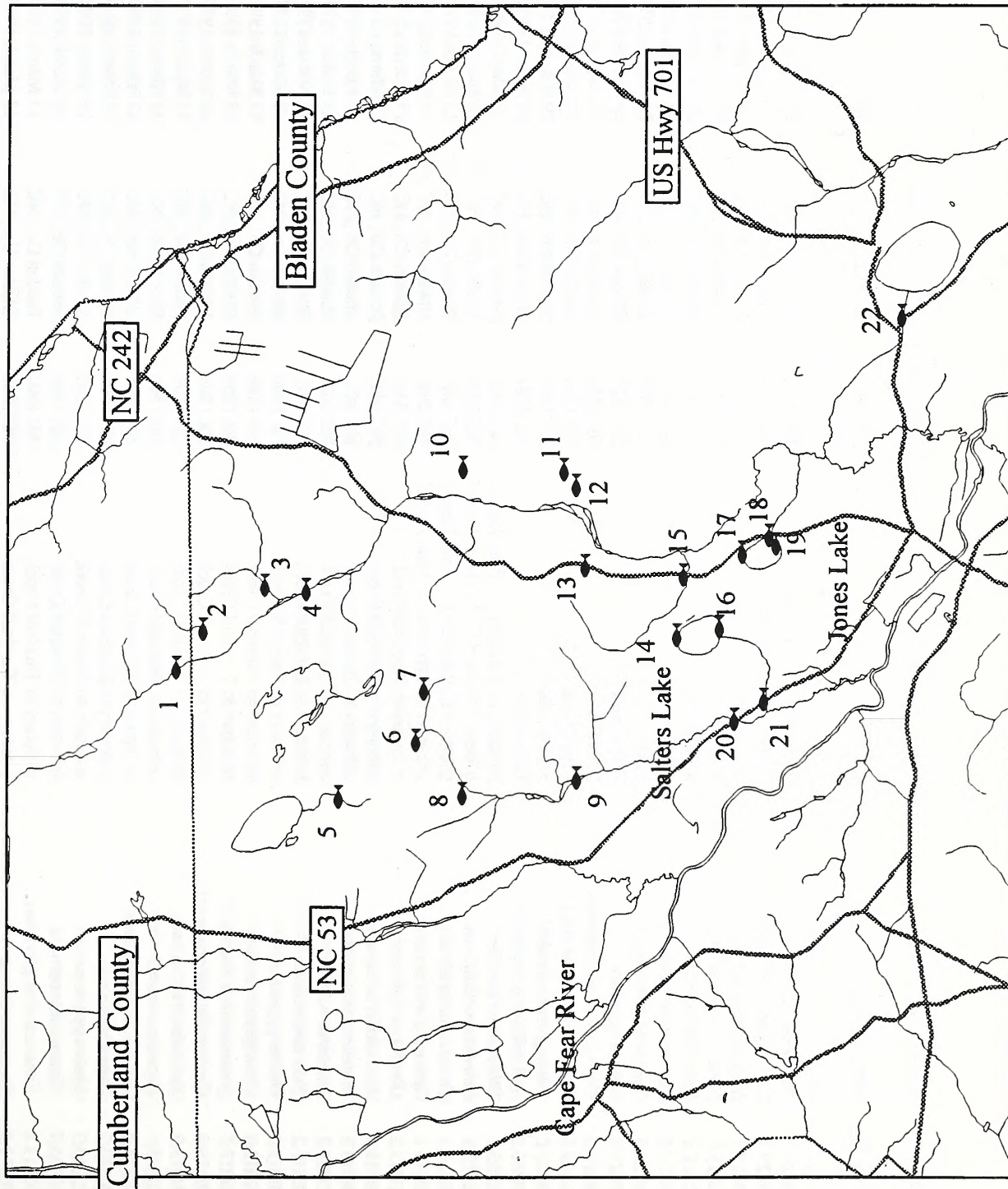


Table 2. Fish found in Jones Lake, Salters Lake, and the Turnbull Creek and Ellis Creek subbasins

<u>Station No.</u>	<u>Scientific Name</u>	<u>Waterway</u>	<u>Common Locality</u>	<u>County</u>	<u>Date</u>	<u>Number</u>	<u>Identified By</u>
960829.1	<i>Ameiurus natalis</i>	tributary to Ellis Creek	NC 53	Bladen Co., NC	29 August 1996	1	G.B. Mottesi
960829.1	<i>Centrarchus macropterus</i>	tributary to Ellis Creek	NC 53	Bladen Co., NC	29 August 1996	1	G.B. Mottesi
960829.2	<i>Esox americanus</i>	Ellis Creek	NC 53	Bladen Co., NC	29 August 1996	1	G.B. Mottesi
960829.2	<i>Perca flavescens</i>	Ellis Creek	NC 53	Bladen Co., NC	29 August 1996	1	G.B. Mottesi
960829.2	<i>Erimyzon succetta</i>	Ellis Creek	NC 53	Bladen Co., NC	29 August 1996	2	G.B. Mottesi
960829.2	<i>Notropis chalybaeus</i>	Ellis Creek	NC 53	Bladen Co., NC	29 August 1996	1	G.B. Mottesi
960829.3	<i>Emneacanthus obesus</i>	Ellis Creek	SR 1324	Bladen Co., NC	29 August 1996	3	G.B. Mottesi
960829.3	<i>Noturus gyrinus</i>	Ellis Creek	SR 1324	Bladen Co., NC	29 August 1996	1	G.B. Mottesi
960829.3	<i>Centrarchus macropterus</i>	Ellis Creek	SR 1324	Bladen Co., NC	29 August 1996	3	G.B. Mottesi
960829.3	<i>Emneacanthus gloriosus</i>	Ellis Creek	SR 1324	Bladen Co., NC	29 August 1996	1	G.B. Mottesi
960829.3	<i>Chologaster cornuta</i>	Ellis Creek	SR 1324	Bladen Co., NC	29 August 1996	2	G.B. Mottesi
960829.3	<i>Aphredoderus sayanus</i>	Ellis Creek	SR 1324	Bladen Co., NC	29 August 1996	2	G.B. Mottesi
970313.1	<i>Etheostoma serrafer</i>	tributary to Turnbull Cr. from Jones L.	NC 242	Bladen Co., NC	13 March 1997	1	G.B. Mottesi
970313.1	<i>Etheostoma fusiforme</i>	tributary to Turnbull Cr. from Jones L.	NC 242	Bladen Co., NC	13 March 1997	1	G.B. Mottesi
970313.1	<i>Emneacanthus obesus</i>	tributary to Turnbull Cr. from Jones L.	NC 242	Bladen Co., NC	13 March 1997	1	G.B. Mottesi
970313.1	<i>Aphredoderus sayanus</i>	tributary to Turnbull Cr. from Jones L.	NC 242	Bladen Co., NC	13 March 1997	9	G.B. Mottesi
970313.2	<i>Gambusia holbrooki</i>	tributary to Turnbull Creek	NC 242	Bladen Co., NC	13 March 1997	abundant	G.B. Mottesi
970313.2	<i>Aphredoderus sayanus</i>	tributary to Turnbull Creek	NC 242	Bladen Co., NC	13 March 1997	1	G.B. Mottesi
970313.2	<i>Emneacanthus obesus</i>	tributary to Turnbull Creek	NC 242	Bladen Co., NC	13 March 1997	1	G.B. Mottesi
970313.2	<i>Ameiurus natalis</i>	tributary to Turnbull Creek	NC 242	Bladen Co., NC	13 March 1997	1	G.B. Mottesi
970313.2	<i>Esox americanus</i>	tributary to Turnbull Creek	NC 242	Bladen Co., NC	13 March 1997	1	G.B. Mottesi
970313.3	<i>Umbra pygmaea</i>	tributary to Turnbull Creek	SR 1509	Bladen Co., NC	13 March 1997	3	G.B. Mottesi
970313.3	<i>Chologaster cornuta</i>	tributary to Turnbull Creek	SR 1509	Bladen Co., NC	13 March 1997	2	G.B. Mottesi
970313.3	<i>Emneacanthus obesus</i>	tributary to Turnbull Creek	SR 1509	Bladen Co., NC	13 March 1997	2	G.B. Mottesi
970313.3	<i>Centrarchus macropterus</i>	tributary to Turnbull Creek	SR 1509	Bladen Co., NC	13 March 1997	1	G.B. Mottesi
970313.3	<i>Aphredoderus sayanus</i>	tributary to Turnbull Creek	SR 1509	Bladen Co., NC	13 March 1997	2	G.B. Mottesi
970313.4	<i>Esox americanus</i>	tributary to Turnbull Creek	SR 1505	Bladen Co., NC	13 March 1997	1	G.B. Mottesi
970313.4	<i>Aphredoderus sayanus</i>	tributary to Turnbull Creek	SR 1505	Bladen Co., NC	13 March 1997	1	G.B. Mottesi
970313.7	<i>Esox americanus</i>	tributary to Turnbull Creek	SR 1505	Bladen Co., NC	13 March 1997	1	G.B. Mottesi
970313.7	<i>Umbra pygmaea</i>	tributary to Turnbull Creek	SR 1505	Bladen Co., NC	13 March 1997	2	G.B. Mottesi
970313.7	<i>Chologaster cornuta</i>	tributary to Turnbull Creek	SR 1505	Bladen Co., NC	13 March 1997	1	G.B. Mottesi
970313.8	<i>Emneacanthus gloriosus</i>	tributary to Turnbull Creek	SR 1002	Bladen Co., NC	13 March 1997	1	G.B. Mottesi
970313.8	<i>Esox americanus</i>	tributary to Turnbull Creek	SR 1002	Bladen Co., NC	13 March 1997	1	G.B. Mottesi
970324.1	<i>Chologaster cornuta</i>	tributary to Turnbull Creek	NC 242	Bladen Co., NC	24 March 1997	1	G.B. Mottesi
970324.1	<i>Aphredoderus sayanus</i>	tributary to Turnbull Creek	NC 242	Bladen Co., NC	24 March 1997	1	G.B. Mottesi
970324.3	<i>Emneacanthus obesus</i>	tributary to Ellis Creek	SR 1327	Bladen Co., NC	24 March 1997	1	G.B. Mottesi
970324.3	<i>Esox americanus</i>	tributary to Ellis Creek	SR 1327	Bladen Co., NC	24 March 1997	3	G.B. Mottesi

Table 2. Fish found in Jones Lake, Salters Lake, and the Turnbull Creek and Ellis Creek subbasins (cont.)

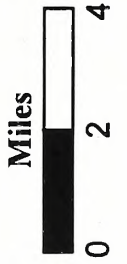
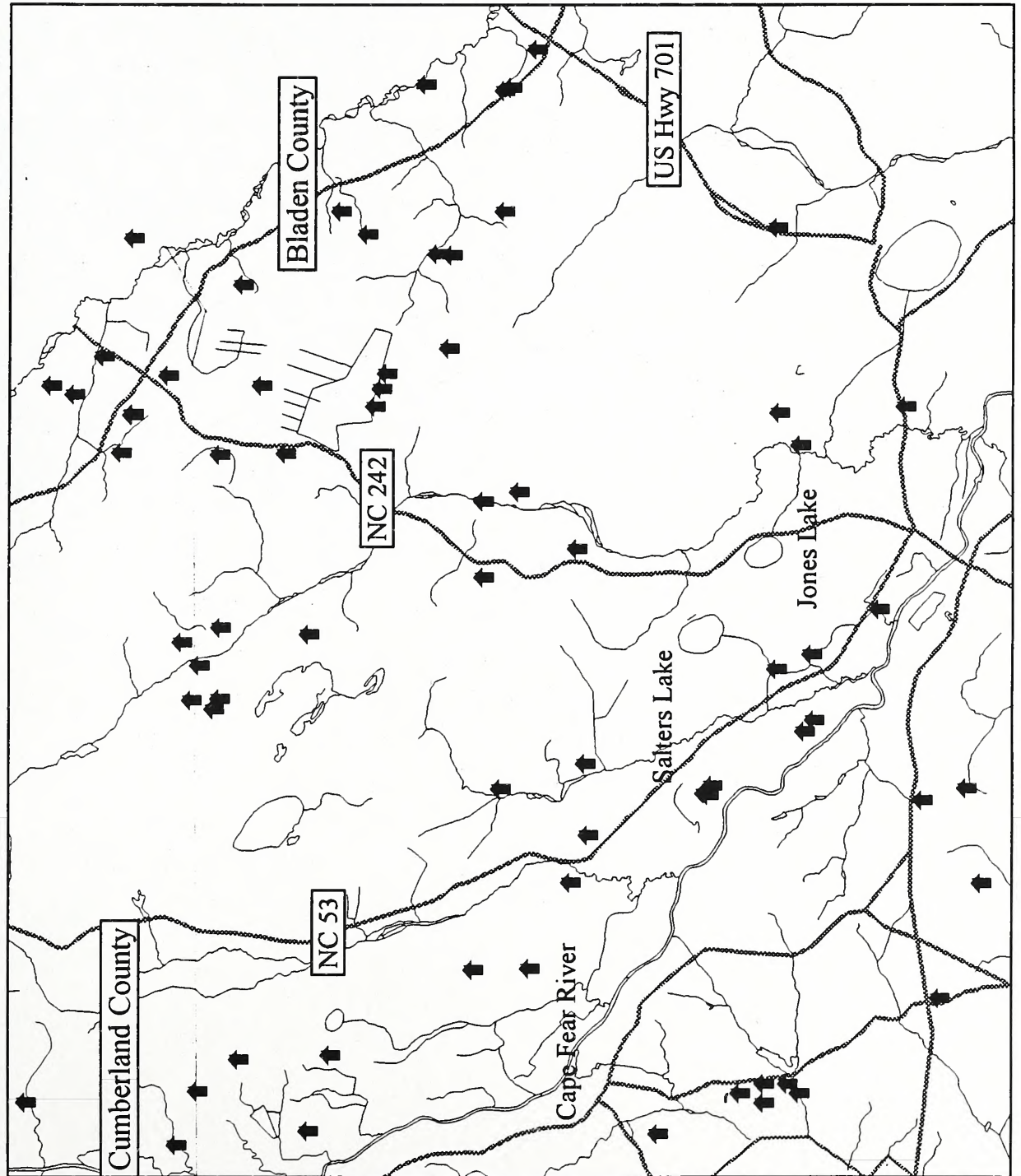
<u>Station No.</u>	<u>Scientific Name</u>	<u>Waterway</u>	<u>Common Locality</u>	<u>County</u>	<u>Date</u>	<u>Number</u>	<u>Identified By</u>
970324.4	<i>Umbra pygmaea</i>	tributary to Turnbull Creek	SR 1002	Bladen Co., NC	24 March 1997	1	G.B. Mottesi
970324.4	<i>Emneacanthus obesus</i>	tributary to Turnbull Creek	SR 1002	Bladen Co., NC	24 March 1997	3	G.B. Mottesi
970325.1	<i>Umbra pygmaea</i>	tributary to Turnbull Creek	NC 53	Bladen Co., NC	25 March 1997	1	G.B. Mottesi
970325.1	<i>Emneacanthus obesus</i>	tributary to Turnbull Creek	NC 53	Bladen Co., NC	25 March 1997	3	G.B. Mottesi
970325.1	<i>Aphredoderus sayanus</i>	tributary to Turnbull Creek	NC 53	Bladen Co., NC	25 March 1997	1	G.B. Mottesi
970610.4	<i>Esox americanus</i>	Ellis Creek	SR 1325	Bladen Co., NC	10 June 1997	2	G.B. Mottesi
970610.4	<i>Percia flavescens</i>	Ellis Creek	SR 1325	Bladen Co., NC	10 June 1997	1	G.B. Mottesi
970610.4	<i>Centrarchus macropterus</i>	Ellis Creek	SR 1325	Bladen Co., NC	10 June 1997	2	G.B. Mottesi
970610.4	<i>Aphredoderus sayanus</i>	Ellis Creek	SR 1325	Bladen Co., NC	10 June 1997	6	G.B. Mottesi
970610.5	<i>Aphredoderus sayanus</i>	tributary to Ellis Creek	SR 1325	Bladen Co., NC	10 June 1997	1	G.B. Mottesi
970610.5	<i>Centrarchus macropterus</i>	tributary to Ellis Creek	SR 1325	Bladen Co., NC	10 June 1997	2	G.B. Mottesi
970610.5	<i>Chologaster cornuta</i>	tributary to Ellis Creek	SR 1325	Bladen Co., NC	10 June 1997	1	G.B. Mottesi
970610.5	<i>Emneacanthus obesus</i>	tributary to Ellis Creek	SR 1325	Bladen Co., NC	10 June 1997	2	G.B. Mottesi
970610.5	<i>Esox americanus</i>	tributary to Ellis Creek	SR 1325	Bladen Co., NC	10 June 1997	8	G.B. Mottesi
970610.5	<i>Percia flavescens</i>	tributary to Ellis Creek	SR 1325	Bladen Co., NC	10 June 1997	1	G.B. Mottesi
970611.1	<i>Umbra pygmaea</i>	Turnbull Creek	SR 2046	Cumberland Co., NC	11 June 1997	1	G.B. Mottesi
970611.1	<i>Gambusia holbrooki</i>	Turnbull Creek	SR 2046	Cumberland Co., NC	11 June 1997	1	G.B. Mottesi
970611.1	<i>Esox americanus</i>	Turnbull Creek	SR 2046	Cumberland Co., NC	11 June 1997	7	G.B. Mottesi
970611.1	<i>Emneacanthus gloriosus</i>	Turnbull Creek	SR 2046	Cumberland Co., NC	11 June 1997	1	G.B. Mottesi
970611.1	<i>Centrarchus macropterus</i>	Turnbull Creek	SR 2046	Cumberland Co., NC	11 June 1997	10	G.B. Mottesi
970611.1	<i>Aphredoderus sayanus</i>	Turnbull Creek	SR 2046	Cumberland Co., NC	11 June 1997	10	G.B. Mottesi
970611.2	<i>Aphredoderus sayanus</i>	Turnbull Creek	SR 1331	Bladen Co., NC	11 June 1997	9	G.B. Mottesi
970611.2	<i>Emneacanthus gloriosus</i>	Turnbull Creek	SR 1331	Bladen Co., NC	11 June 1997	3	G.B. Mottesi
970611.2	<i>Esox americanus</i>	Turnbull Creek	SR 1331	Bladen Co., NC	11 June 1997	17	G.B. Mottesi
970611.2	<i>Umbra pygmaea</i>	Turnbull Creek	SR 1331	Bladen Co., NC	11 June 1997	1	G.B. Mottesi
970611.4	<i>Gambusia holbrooki</i>	channelized trib. to Ellis Creek	SR 1325	Bladen Co., NC	11 June 1997	abundant	G.B. Mottesi
970611.4	<i>Esox americanus</i>	channelized trib. to Ellis Creek	SR 1325	Bladen Co., NC	11 June 1997	1	G.B. Mottesi
970611.4	<i>Emneacanthus obesus</i>	channelized trib. to Ellis Creek	SR 1325	Bladen Co., NC	11 June 1997	3	G.B. Mottesi
970611.4	<i>Emneacanthus gloriosus</i>	channelized trib. to Ellis Creek	SR 1325	Bladen Co., NC	11 June 1997	7	G.B. Mottesi
970611.4	<i>Centrarchus macropterus</i>	channelized trib. to Ellis Creek	SR 1325	Bladen Co., NC	11 June 1997	1	G.B. Mottesi
970624.1	<i>Etheostoma fusiforme</i>	Jones Lake	NW side	Bladen Co., NC	24 June 1997	10	G.B. Mottesi
970624.2	<i>Etheostoma fusiforme</i>	Jones Lake	at boat ramp	Bladen Co., NC	24 June 1997	1	G.B. Mottesi
970624.4	<i>Emneacanthus gloriosus</i>	Salters Lake	NW side	Bladen Co., NC	24 June 1997	7	G.B. Mottesi
970624.4	<i>Etheostoma fusiforme</i>	Salters Lake	NW side	Bladen Co., NC	24 June 1997	1	G.B. Mottesi
970624.4	<i>Percia flavescens</i>	Salters Lake	NW side	Bladen Co., NC	24 June 1997	1	G.B. Mottesi
970624.5	<i>Emneacanthus gloriosus</i>	Salters Lake	boat ramp	Bladen Co., NC	24 June 1997	1	G.B. Mottesi
970624.5	<i>Centrarchus macropterus</i>	Salters Lake	boat ramp	Bladen Co., NC	24 June 1997	1	G.B. Mottesi

Animal Facilities

Gabriela B. Mottes, Nongame Biologist
Nongame and Endangered Wildlife Program
Division of Wildlife Management
NC Wildlife Resources Commission

The following map shows the animal facilities near and around the waterways of Jones Lake State Park. This information was acquired from the Water Quality Section, Division of Environmental Management, North Carolina Department of Environment, Health, and Natural Resources.

JONES LAKE STATE PARK ANIMAL FACILITIES



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